IN THE CLAIMS:

This listing of claims will replace all prior versions, and listing, of claims in the application.

Listing of the Claims:

1. (Currently amended) A time delay beamformer comprising a plurality of input channels, each channel having associated ~~sample~~ sampler arranged to sample an input signal carried upon the input channel at a plurality of points in time to produce a plurality of sampled signals; a processor arranged to receive said input signals and said sampled signals, or signals indicative of each of the input signals and each of the plurality of sampled signals, and arranged to generate space-time processed signals therefrom; a steering time delay arranged to introduce a steering time delay to said processed signals, or to signals indicative of said processed signals to produce at least two delayed signals; and a summer arranged to generate a beamformed output signal from the delayed signals, or from signals derived from the delayed signals.

2. (Original) A beamformer according to claim 1 wherein the processing means is arranged to output a plurality of processed signals, and the time delay means is adapted to apply a time delay on a plurality of processed signals to form a plurality of time delayed signals, and the summation means is adapted to generate a beamformed output signal from said plurality of time delayed signals.

3. (Previously presented) A beamformer according to claim 2 wherein there are substantially as many processed signals produced by the processor as there are input signals.

4. (Previously presented) A beamformer according to claim 2 wherein there are substantially as many time delayed signals as processed signals.

5. (Previously presented) A beamformer according to claim 1 wherein the adaptive processing means is arranged to generate an input data covariance matrix from the input channels and the sampled signals.

6. (Original) A beamformer according to claim 5 wherein the processing means is arranged to apply steering vectors to each entry in a matrix derived from the covariance matrix, or vice versa.

7. (Previously presented) A beamformer according to claim 1 wherein the processing means is arranged to generate steering time delays, or at least one steering time delay, which is/are passed to the time delay means.

8. (Previously presented) A beamformer according to claim 1 wherein each time delay means is spaced by a time that is approximately equal to the pulse repetition interval of a transmitted, pulsed signal.

9. (Previously presented) A beamformer according to claim 1 in which the time delay means comprise time delay taps derived from input channels.

10. (Previously presented) A beamformer according to claim 1 comprising n input channels, each input channel having m time delayed means.

11. (Original) A beamformer according to claim 10 comprising nm, or less than nm, time delay means arranged to generate nm, or less, steered beam directions.

12. (Previously presented) A beamformer according to claim 1 wherein the channels comprise a plurality of signal sensors adapted to detect an incident wave and signal transmit lines adapted to transmit channel signals from the sensors to the processing means, the time delay means comprising tapped lines taking tapped signals from different places along the lengths of the signal transmit lines such that the processing means receives tapped, time delayed signals from the tapped lines, as well as the channel signals from the signal transmit lines, the arrangement being such that the time delays of the tapped signals are fixed for each tapped signal.

13. (Previously presented) A beamformer according to claim 1 wherein the steering time delays applied by the steering time delay means to a particular input channel are variable depending upon the signals received by the other input channels.

14. (Previously presented) A beamformer according to claim 1 wherein the processing means is programmed to apply adaptive weights to the signals of the input channels, the weighting applied to the signal of specific input channels being dependent upon the signals received from other input channels.

15. (Previously presented) A method of time delay beamforming comprising the steps of:

i) tapping input signals of a plurality of detected signal inputs at regular time intervals to produce a plurality of time delayed sampled signals;

ii) processing input signals, or signals indicative of the input signal(s), and the time delayed sampled signals, or signals indicative of the sampled signals, to reject unwanted signal components therefrom, to produce a plurality of processed signals;

iii) applying a steering time delays to the processed signal(s), or signal(s) indicative of the processed signal(s) to produce a plurality of delayed signals; and

iv) generating a beamformed output from the delayed signals, or from a signal indicative of the delayed signals.

16. (Original) The method of claim 15 including generating a covariance matrix from the input channels and the sampled signals.

17. (Original) The method of claim 16 including generating an nm x nm dimensional covariance matrix where n is the number of input channels and m is a number of taps.

18. (Original) The method of claim 17 including generating nm, or less, steered beam directions, using nm, or less than nm, time delay means.

19. (Previously presented) The method of claim 16 including applying steering vectors to each entry in the covariance matrix.

20. (Previously presented) The method of claim 15 including generating steering time delays, or at least one steering time delay, and passing the steering time delays to time delay means and delaying processed signals produced by the processor by the steering time delays.

21. (Previously presented) The method of claim 15 comprising tapping the input signals at times that are spaced by approximately the pulse repetition interval of a transmitted, pulsed signal that is being detected by the beamformer.

22. (Previously presented) The method of claim 15 wherein the input signals are adaptively weighted to produce the processed signals.

23. (Currently amended) A method of reducing the computational load associated with beamforming comprising the steps of:

i) generating an estimated covariance matrix from a plurality of time delay tapped input channels;

ii) forming an adaptive weight vector for a space-time channel from a column of the inverse of the covariance matrix;

iii) applying the adaptive weight vector to the space-time channel to form an interferance cancelled spatial channel[[p]]; and

iv) applying a time delay to the spatial channel.

24. (Original) The method of claim 23 including summing the delayed at least one output channel signal to form a beamformed output.

25. (Original) A method of increasing the resolution of a sideways sensing sensor array comprising the steps of:

i) receiving a plurality of input channel signals;

ii) tapping a plurality of time delayed, tapped, sampled signals from each of the input channels; and

iii) applying space time adaptive processing to the plurality of input channel signals and sampled signals so preserve the linear relationship between Doppler frequency and angle of return.

26. (Previously presented) The method of claim 15 wherein a plurality of beam directions are produced simultaneously or substantially simultaneously.

27. (Previously presented) The method of claim 26 comprising beamforming from at least 5, or 10, or 20, or 30 directions simultaneously or substantially simultaneously.

28. (Previously presented) A radar, or sonar, or telecommunications device comprising a time delay beamformer according to claim 1.

29. (Previously presented) A beamformer of claim 1 configured for beamforming from a plurality of beam directions simultaneously or substantially simultaneously.

30. (Previously presented) A radar, or sonar, or telecommunications device adapted to use the method of claim 15.